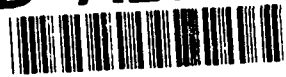


AD-A252 006 ACTION PAGE

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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 06/92		3. REPORT TYPE AND DATES COVERED POP Test (05/92)	
4. TITLE AND SUBTITLE Performance Oriented Packaging Testing of Container, Shipping and Storage, Air Stabilizer for Packing Group II Solid Hazardous Materials				5. FUNDING NUMBERS 92-16268 	
6. AUTHOR(S) Dennis M. Kotun					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Weapons Station Earle Test and Evaluation Branch (Code 5023) Colts Neck, NJ 07722-5000				8. PERFORMING ORGANIZATION REPORT NUMBER DODPOPHM/USA/DOD/NADTR92010	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Commander, Naval Sea Systems Command (PMS-416) Department of the Navy Washington, DC 20362-8050				10. SPONSORING/MONITORING AGENCY REPORT NUMBER Same as above	
11. SUPPLEMENTARY NOTES N/A					
12a. DISTRIBUTION/AVAILABILITY STATEMENT				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This Performance Oriented Packaging (POP) test was conducted to ascertain whether the Air Stabilizer Shipping and Storage Container meets the Packing Group II requirements specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 1 October 1991. The container's contents consisted of one inert Mk 34 Mod 0 Air Stabilizer weighing 10 kg (22 pounds), and an additional 1 kg (3 pounds) of weight. Gross weight of the loaded container was 14 kg (32 pounds). The test results indicate that the container has conformed to the POP requirements.					
14. SUBJECT TERMS POP Test of Air Stabilizer Shipping and Storage Container				15. NUMBER OF PAGES 7	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED		18. SECURITY CLASSIFICA- TION OF THIS PAGE UL		19. SECURITY CLASSIFICA- TION OF ABSTRACT UL	
				20. LIMITATION OF ABSTRACT UL	

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**PERFORMANCE ORIENTED PACKAGING TESTING
OF
CONTAINER, SHIPPING AND STORAGE, AIR STABILIZER
FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS**

Author:
Dennis M. Kotun
Mechanical Engineering Technician

Performing Activity:
Naval Weapons Station Earle
Colts Neck, New Jersey 07722-5000

June 1992

FINAL

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the Air Stabilizer Shipping and Storage Container (Packing Group II) meets the requirements specified by the United Nations Recommendation on the Transportation of Dangerous Goods Document, ST/SG/AC.10/1, Revision 6, Chapters 4 and 9 and the Code of Federal Regulations, Title 49 CFR, Parts 107 through 178, dated 1 October 1991. The container's contents consisted of one inert Mk 34 Mod 0 Air Stabilizer weighing 10 kg (22 pounds), and an additional 1 kg (3 pounds). Gross weight of the loaded container was 14 kg (32 pounds).

Due to unavailability only one container was used for testing. This is less than the number required by the regulations. Approval for this deviation has been granted by the Under Secretary of Defense, Memorandum for the Joint Logistics Commanders dated 22 February 1990.

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.608. The container was placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the container was restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the container left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour.

2. Stacking Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.606. The container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a minimum height of 3 meters (including the test container). A weight of 145 kg (320 pounds) was stacked on the test container. The test was performed for 24 hours. The weight was then removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR, Part 178, Subpart M, Sec. 178.603. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

- a. Flat bottom.
- b. Flat top.
- c. Flat on long side.
- d. Flat on short side.
- e. One corner.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR, Sec. 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR, Sec. 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR, Sec. 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 3.6 Hz. Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and inspected. No unfavorable distortion or deterioration was observed.

2. Stacking Test

The container was inspected after the 24-hour period was over. No unfavorable distortion or deterioration was observed.

3. Drop Test

After each drop, the container was inspected. The air stabilizer was completely retained by the container.

REFERENCE MATERIAL

A. United Nation's "Recommendation on the Transportation of Dangerous Goods," ST/SG/AC.10/1, Revision 6.

B. Code of Federal Regulations, Title 49 CFR, Parts 107-178.

C. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

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TEST DATA SHEET

DATA SHEET:	
Container: Air Stabilizer Shipping and Storage Container	
Type: 4G	Container P/N or NSN: NSN 1356-01-297-9046
Specification Number: 6206163	Material: Fiberboard
Gross Weight: 14 kg (32 pounds)	Dimensions: 14-1/2" L x 14-1/2" W x 11-1/2" H
Closure (Method/Type): Tape	Tare Weight: 3.1 kg (7 pounds)
Additional Description:	
PRODUCT:	
Name: See table	NSN(s): See table
United Nations Number: See table	
United Nations Packing Group: II	
Physical State (Solid, Liquid, or Gas): Solid	
Vapor Pressure (Liquids Only): N/A At 50 °C: N/A At 55 °C: N/A	
Consistency/Viscosity: N/A	Density/Specific Gravity: N/A
Amount Per Container:	Flash Point: N/A
Net Weight: See table	
TEST PRODUCT:	
Name: Mk 34 Mod 0 Air Stabilizer	Physical State: Solid
Consistency: N/A	Density/Specific Gravity: N/A
Test Pressure (Liquids Only): N/A	
Amount Per Container: N/A	Net Weight: 11.3 kg (25 pounds)
Additional Description:	
The net weight includes the current maximum product weight plus an additional 1.3 kg (3 pounds).	

TABLE 1
Products Approved for Shipping in the
Air Stabilizer Shipping and Storage Container

NALC	NSN	Product Type	Packing Drawing	Haz Class/Div	UN Number	Units/Cntr	Unit Weight (lb)
5W86	1356-01-297-9046	Mk 34 Air Stabilizer	6206163	1.4S	0173	1	22

**AIR STABILIZER
SHIPPING AND STORAGE CONTAINER
POP MARKING**

UN 4G/Y14/S/*/USA/DOD/NAD**

***** YEAR LAST PACKED OR MANUFACTURED**

Encl (2)